

CLAIMS

1. Process for oxidising a substrate which is a halo aromatic compound, which process comprises oxidising said substrate with a monooxygenase enzyme.

2. Process according to claim 1 in which the enzyme comprises a substitution
5 of an amino acid in the active site by an amino acid with a less polar side-chain.

3. Process according to claim 2 in which the enzyme comprises one or more other amino acid substitutions in the active site.

4. Process according to any one of the preceding claims in which the enzyme
is

- 10 (i) P450_{cam}, or
(ii) a naturally occurring homologue of (i), or
(iii) a mutant of (i) or (ii).

5. Process according to claim 4 in which the enzyme is one in which amino
acid 96 of P450_{cam}, or the equivalent amino acid in a homologue, has been changed to an
15 amino acid with a less polar side-chain.

6. Process according to any one of the preceding claims in which the halogen
is chlorine.

7. Process according to any one of the preceding claims in which the aromatic
compound is a benzene or biphenyl.

20 8. Process according to any one of the preceding claims in which the substrate
has more than one halogen atom.

9. Process according to claim 8 in which the substrate is 1, 2-dichlorobenzene,
1, 2, 4- trichlorobenzene, 3,3'-dichlorobiphenyl or 2,2',4,5,5'-pentachlorobiphenyl.

25 10. Process according to claim 8 in which the substrate is
pentachlorobenzene or hexachlorobenzene.

11. Process according to any one of the preceding claims which is carried out in
a cell that expresses:

- 30 (a) an enzyme as defined in any one of claims 1 to 5;
(b) an electron transfer reductase; and
(c) an electron transfer redoxin.

12. Process according to claim 11 in which:

- (b) is putidaretoxin reductase or a homologue; or a fragment thereof; and/or

-27-

(c) is putidaretoxin or a homologue; or a fragment thereof.

13. Process according to claim 11 or 12 wherein the cell is one in which the enzyme (a) does not naturally occur.

5 14. Process according to any one of claims 11 to 13 wherein the cell is one which in its naturally occurring form is able to oxidise a substrate as defined in any one of claims 6 to 10.

15. A cell as defined in claim 14.

16. A transgenic animal or plant whose cells are as defined in any one of claims 11 to 14.

10 17. Method of treating a locus contaminated with a substrate as defined in any one of claims 1 or 6 to 10 comprising contacting the locus with an enzyme as defined in any one of claims 1 to 5 or a cell as defined in any of claims 11 to 13, or an animal or plant as defined in claim 16.

15 18. Process for selecting a mutant of an enzyme as defined in claim 1, 4(i) or 4(ii) for its ability to oxidise a substrate as defined in claim 1, or any one of the claims 6 to 10, which process comprises screening a library of said mutants for their oxidation effect on the substrate.

19. Process, cell, animal, plant or method according to any one of claims 1 to 17 wherein the enzyme is one that has been selected in a process according to claim 18.